AMERICAN
JOURNAL OF SURGERY

VOL. XXXV. JANUARY, 1921. No. 1

THE SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

W. MEDDAUGH DUNNING, M.D.,
Consulting Otologist, Fordham Hospital; Consulting Otologist, Manhattan State Hospital; Consulting Laryngologist, Ossining City Hospital; Consulting Laryngologist, The Alexander Linn Hospital, Sussex, N. J.; Junior Surgeon, Manhattan Eye and Ear Hospital; Surgeon, Bronx Eye and Ear Infirmary, etc.
NEW YORK CITY.

I. THE NOSE.

It is a matter of lively interest to humanity that the nose do its work well. This interest is so great that it is strange to find that attention to the pathology of the nose is to a great extent a matter of our own generation. In our older medical texts consideration of diseases of the nose covers not more than two or three pages. When many present day practitioners were undergraduate students perhaps one-half of a lecture was devoted to the same subject. But with the accumulation of special knowledge of the past decades growing out of the increase in clinical instruction, a special technique and a rapidly increasing literature has come into existence.

With the development of knowledge concerning the nose and its work came a realization that its prominence exposed it to injuries which became the source of other difficulties often not traced to their true source. Breaks, dislocations, and bruises, often looked upon at the time as negligible and of little moment, are later found to have caused blockages of the air passages which have interfered with normal breathing and with the drainage of the sinuses, and have caused serious nervous difficulties. Among the chief causes of these difficulties are deflection of the nasal septum. The development of surgical technique has made possible the correction of many of these difficulties with the aid of the knife.

It is the purpose of this study to put into a permanent form the result of many years of study of the causes and results of deviations of the nasal septum, together with a description of the operation for relief from the results of these deviations —the submucous resection of the nasal septum. Operations for these difficulties have been performed not more than twenty years. The operation is still classed as one of the most delicate and difficult of intranasal operations, (Phillips, Porter, Harmon Smith.) It therefore seems desirable to add to the information available the results of the writer's clinic and private practice in dealing with several thousand cases.

In order to present more clearly the special study, we shall first consider briefly the normal nose, taking into account the pertinent features of its anatomy, physiology, and neurology.

The nose consists anatomically of two parts: the outer nose; and the nasal cavities contained in the skull. The lower segment is the part concerned in respiration. In the upper part the cavities support the membrane containing the nerves of smell. Posteriorly the nose is continuous with the cavity called the naso-pharynx, the two openings into which are called the choanae. The bony frame of the nose is a part of the skull, but the outer nose is supported by bone above only; the rest of its shape is kept by cartilaginous structures varying with race and individual. The anterior part of the nose is known as the ala or vestibule. This combination of bone and cartilage in the structure of the nose is of great importance, as we shall see in the study of fractures, dislocations, and deviations.

The roof of the nose, which is very narrow, is formed in front by the ethmoid and behind by the sphenoid. It is here, through the cribriform plate of the ethmoid bone, that some twenty non-medullated nerves pass to supply the sensory organs in the olfactory mucous membrane. This area comprising the olfactory sense is very small, about 5 square centimeters in area, according to Watson, and consists of a small membrane lining the roof and sides of each nasal cavity.

The external wall of the nose is the most important of its areas from the surgical point of view. Continued malformations of the septum react on this outer wall with grave results. This area is formed by the lateral mass of the ethmoid, the inner surface of the superior maxilla, the vertical plate of the palate bone, and the internal pterygoid plate of the sphenoid. To these outer walls are attached the turbinated bodies, structures made up of thin osseous shell and covered by a vascular cavernous

tissue possessing erectile tissue. These turbinated bodies project downward in such a way that the internal nose is divided into three cavities, or meatuses. There are usually said to be three of these bodies in the human nose, although by its lack of function and its difference in structure the body called the superior turbinate, situated quite above and behind and nearly always invisible, is perhaps questionably classed as a turbinate.

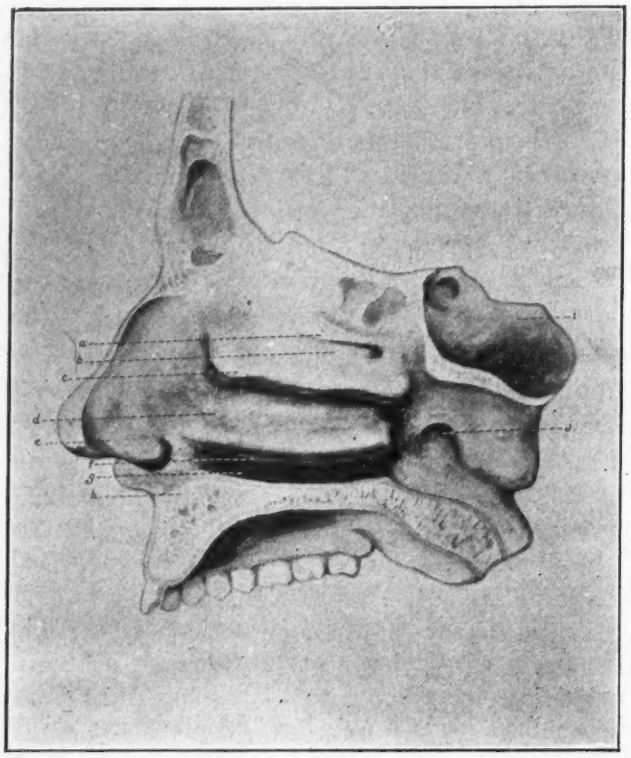

Fig. X-1—Specimen showing outer wall of internal nose, illustrating turbinated bodies and meatuses; *a*, superior turbinate; *b*, superior meatus; *c*, middle turbinate; *d*, middle meatus; *e*, vestibule; *f*, inferior turbinate; *g*, inferior meatus; *h*, superior maxilla; *i*, sphenoidal sinus; *j*, orifice of eustachian tube.

(Douglas.) (See fig. X-1, also the drawing of the structure of a deer's nose, fig. X-2).

The region between the so-called superior turbinate and the roof of the nose is known as the "recessus spheno-ethmoidalis." Into the back of this recess the sphenoidal air sinus opens. Between the superior turbinate and the middle turbinate is the cavity containing the openings of the posterior ethmoidal air cells. The middle meatus, between the middle and inferior turbinates, is the largest of the three, and contains certain important processes. Here are the opening of the frontal sinus, that of the maxillary antrum, and of most of the anterior ethmoidal cells. Towards the front of this cavity is a ridge, the processus uncinatus; further back is a rounded elevation called the bulla ethmoidalis. Sometimes the bulla is so enlarged that there is the appearance of two turbinated bodies in this region, the outer being the bulla, and the inner the true middle turbinate. The bulla is probable a bone cell belonging to the ethmoidal system.

The inferior meatus lies below the inferior turbinate and extends to the nasal orifice. Its external wall contains the nasal duct, an opening into which a probe can pass to the lachrymal duct. This valvular opening lies on the highest point of the external wall of the inferior meatus. The Eustachian tube leading to the ear lies just behind the posterior border of the inferior meatus, and is almost on a level with the posterior end of the inferior turbinated body.

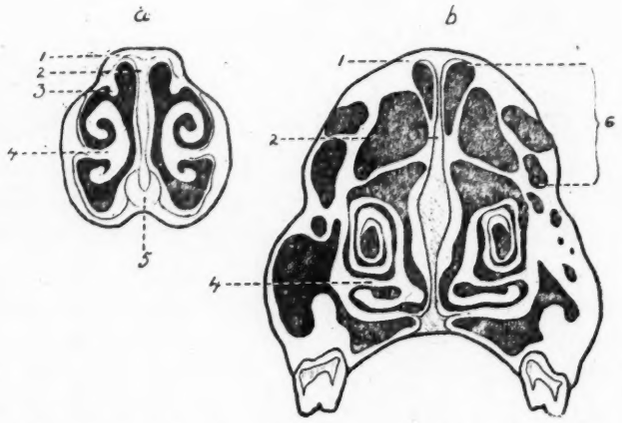

Fig. X-2—Vertical sections through nose of a deer; *a*, anterior; *b*, posterior; 1 ethmoid; 2 septum; 3 middle turbinate (no superior turbinate) 4, inferior turbinate; 5, muscular and cartilaginous structure at inferior extremity of nose; 6, ethmoid cells.

The nasal septum is the partition between the two nasal cavities whose features we have just described. It is composed of a triangular cartilage, the "septal cartilage," with a supporting framework made up of the perpendicular plate of the ethmoid above and of the vomer and the intermavillary bone below. This cartilaginous portion composes about one-third of the divisional area. It extends from near the junction of the nasal bones at their median line to a point near the tip of the nose, and is more or less intimately attached to the nasal cartilages, with an under surface extending from near the nasal orifice along the ridge of the intermaxillary bone. (Fig. X-3. Construction of the septum.) Its posterior edge is attached to the vomer, and the perpendicular plate. The cartilage fits into the septal plate of the ethmoid, the vomer, and the intermaxillary ridge by means of a groove, half moon in shape. (X3-f.) This joint-like surface is of great importance in the study of pathological conditions of the septum, as we shall later have occasion to show, for it is here that injuries cause significant alterations. It should be noted that even with the majority of normal noses the cartilage

does not end with the smooth surface at the point of junction with the bones and groove, but sends out spurs, some normal, others individual or pathological. It is to this osteocartilaginous structure of the nasal septum that its many malformations are due, some of which involve the cartilage, the bone or both.

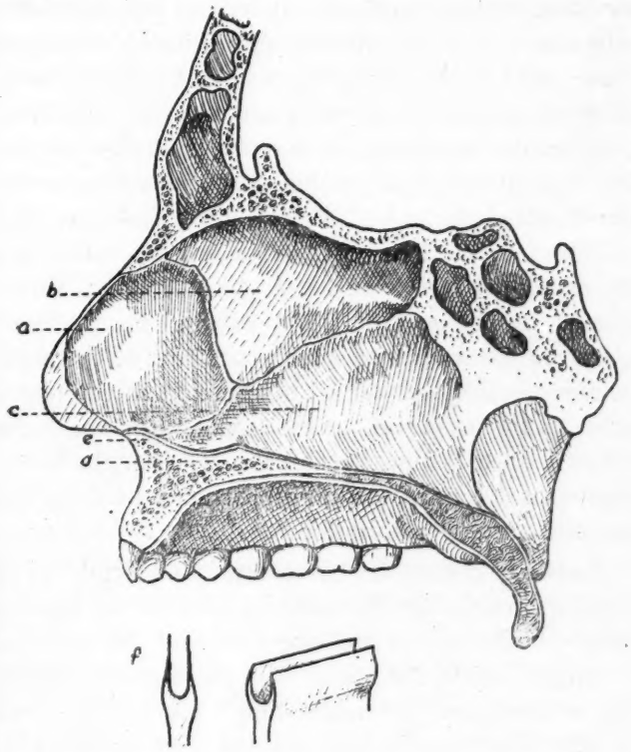

Fig. X-3—Diagram showing parts of septum; *a*, triangular cartilage; *b*, perpendicular plate of the ethmoid; *c*, vomer; *d*, intermaxillary ridge; *e*, crest of intermaxillary ridge; *f*, enlargement for triangular cartilage fitting into the moon-shaped groove of bone.

The greater part of the septum is covered with a thick and highly vascular membrane made up of columnar epithelium with masses of embedded glands. The less vascular but more highly specialized olfactory membrane covers a limited portion of the upper part. Opposite or a little below the anterior end of the middle turbinate there is a thickening on the septum resulting from an accumulation of glands. This is a danger point in the membrane, which is loosely attached to the septum, easily separable, and as a result easily a seat of abscesses and hematomata.

The nasal mucosa lines the nasal cavities proper but not the vestibule, which is covered by an invagination of the true skin of the ala studded with hairs or vibrissæ. This ciliated epithelium acts defensively against infection. The epithelium of the upper part of the nasal cavities, the olfactory region, is non-ciliated, columnar, and highly vascular. Thus the pathology of the membranes of the anterior and upper parts of the nose is quite distinct.

The vascular system of the nose is in close relation with the intracranial circulation. While there are idiosyncratic differences in individuals, it has been the observation of the writer that the greater part of the septal circulation comes from above. (Fig. X-4). The nasal branch of the ophthalmic artery supplies the upper part of the septum; the septal branch of the labial artery and a small branch

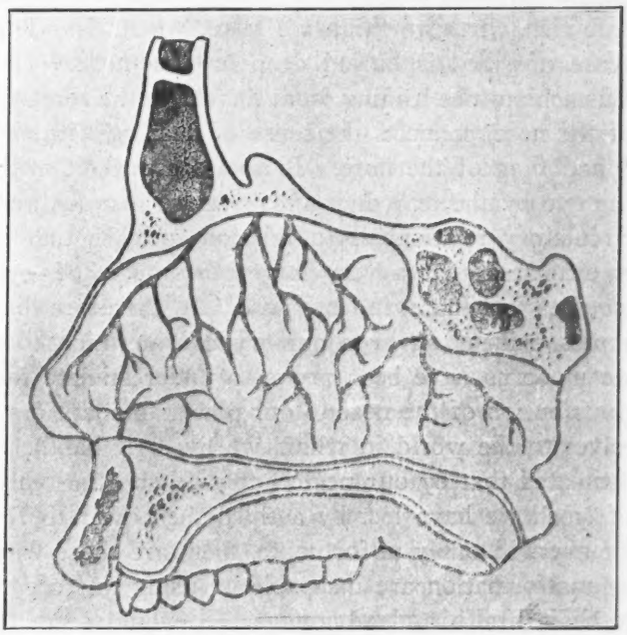

Fig. X-4—Diagrammatic sketch showing circulation of the septum.

from the facial artery supply the anterior part of the septum. In addition, the two naso-palatine arteries, derived from the internal maxillary artery, follow the course of the naso-palatine nerves as they pass along the sides of the vomer and enter the septal ridge. Some of the corpuscular elements of the blood exude from the capillaries to the surface of the glandular epithelium and aid in moistening the inspired air.

The nerve supply of the nose is equally extensive with that of the circulation. This has its unfortunate results as well as those more beneficent, for the nose is the source of innumerable reflexes. The naso-palatine nerves enter the septal ridge through the foramina of Scarpa, where they are so deeply protected by bony canals that it is difficult to reach them by anesthetic.

This brief outline of the structure of the nose indicates that we are dealing with a highly complex organ which because both of structure and location is peculiarly liable to derangement of function. These functions, of smelling and breathing, are of such paramount importance in the physical and mental integration of the organism that we shall

deal with them briefly before taking up the consideration of the pathology of the nasal septum.

II. BREATHING AND SMELLING.

The nose forms the chief portal to the air passages. In fact, it is with the mouth the forefront of the passages leading to the chief thoracic and abdominal viscera. It exercises a high degree of control over the senses of smell, taste, and hearing. Of the sense of taste, it may be said that it is often true that what we think we taste, we smell. The sense of smell is buried deep in the nose. The Eustachian tube leading from the ear to the recesses of the nose, connects the sense of hearing with the functioning of the nose. It is also connected with the eye by the tear duct and by close nervous and circulatory relationship, a relation so close that it is estimated that a very large percentage of eye troubles originate in the nose. It therefore becomes evident on even cursory consideration that we moderns have been prone to underestimate the contribution of the nose to our power to adapt ourselves to the world in which we live. It has been estimated that by our neglect to cultivate the sense of smell we have lost by a third the power to remember. Doubly unfortunate, then, are those who by malformation are incapable of using this organ to their health and advantage. It would seem to be a matter of personal welfare to cultivate this organ, which somehow fell into bad repute, to keep it in good condition, and to restore it when it has lost its power of normal functioning.

Normally, the nostrils are open. This patency is constant, and can be increased in forced expirations by the action of the musculo-cartilaginous structure of the alae, which constitute in part a dilator apparatus. Subjects with over-thin nostrils often have respiratory difficulties. This is especially the case when there is in addition a septal deviation. Atrophy of the structure of the alae may be accompanied in such cases by hypertrophy of the dilator and contractile muscles of the upper cartilaginous tissues.

The region of the nose chiefly concerned in breathing is its lower segment, the part of it below the lower border of the middle turbinate and above the floor of the nose. In inspiration the greater part of the function is carried on between the lower border of the middle turbinate and the lower border of the lower turbinate; in expiration, the greater part of the air comes out through the inferior meatus. That this is true is illustrated by the enlargement of the posterior tip of the lower turbinate. The writer has observed the truth of these statements in his dealings in New York clinics with silver polishers from the great hotels, in whose noses the path of the air currents is clearly marked by the shadings resulting from the polish they have inhaled.

The functions of the intranasal structures in the breathing process seem to be to warm the air, to moisten it, and to cleanse it by the action of the vibrissae of the ciliated epithelium. Although there seem to be air paths, as we have indicated, with eddies in the currents set up by individual peculiarities in shape, it may be said that all the surfaces of the nasal cavities come in contact with the inspired air. An exception to this statement is found in the olfactory region, which, while not closed off from the impact, is sheltered from direct impact by its position high in the nose. Since olfaction is carried on in the upper part of the nasal cavities, it follows that an obstruction in the upper part of the nose will affect smell. For the same reason, since respiration is carried on in the lower region of the nose, the high obstruction will not at the outset affect respiration.

Smelling cannot be carried on independent of breathing, although the anterior part of the nose is chiefly concerned in the one case and the superior or upper part in the other. On the contrary, smelling is dependent upon breathing. Before the scent of any object can be detected, the scent-laden particles of air must go through the narrow slit between the middle turbinate and the septum known as the sulcus olfactorious. (See the drawing of the deer's nose,) This narrow passage is the gateway to the sensory area of the nose, itself a small saddle-shaped membrane lining the roof and sides of the upper nasal cavity and out of the direct path of the air-currents which lead to the posterior part of the nose.

In order to produce an olfactory response the odoriferous substance must be placed in the field from which the air is inspired. The olfactory cell bodies lie in the sensory membrane, the peripheral process of each cell consisting of a number of hair-like structures which project into and slightly beyond the membrane. The other end of the cell gives rise to the nerve fiber, which can be traced upward through the sponge-like bone of the cribriform plate to end around cells situated in the olfactory bulb of the brain.

The olfactory bulb and tract lie beneath the sulcus rectus on the frontal lobe of the brain. The study of comparative anatomy gives phylogenetic evidence that the first stages in the development of the

cortex cerebri occurred in connection with the distance receptors for chemical stimuli, that is, in connection with sensitiveness to smells. The olfactory apparatus even in mammals exhibits a neural architecture of primitive pattern. The cell which conducts impulses to the brain from the olfactory membrane in the human nose resembles cells in the skin of the earthworm in that its cell-body lies actually amid the epithelium of the skin-surface and is not deeply buried near or in the central nervous organ. Moreover, one and the same cell by its external end receives the stimulus and by its deep end excites the central nervous organ. (See the article, Brain, 11th Ed., *Encyclopedia Britannica*, by Charles S. Sherrington.)

Minute particles by their impact upon the termini of the olfactory nerve processes produce the sense of smell. These receptors react to every minute chemical stimuli, probably gaseous particles given off from the stream of inspired or expired air coming into contact by diffusion with the olfactory membrane. The chemical stimuli to which the receptors for smell react are for some substances from 1 to 20,000 per cent. more sensitive than those of taste, although Zwardemaker's olfactometer shows marked variability in individual threshold capacity, with a lowering of the threshold in fatigue in many cases very marked. Hysteria and neurasthenia play their part in disorders of this sense as in the case with other faculties.

This brief description of the nose and its work is given in part to help us visualize the nose as one of the main receptive organs providing data for the rapid and accurate adjustment of the human animal to conditions of time and space, and to show more clearly the need for care in the preservation of the functions so necessary not alone to happiness but to health. A normal nose aids in the coordination of the activities of the trunk with the requirements of the head. Sherrington calls attention to the fact that the olfacto-phrenic respiratory arcs exemplify the integrative function. The nerve fibers from the cephalic receptors end in the grey matter of the central nervous axis not far from their own segment. Thence the conducting arc is continued backward by another strand of fibers, and these reach the mouths of the final common paths in the grey matter of segments of the spinal cord. The ramifications of the neurones attached to the smell receptors are so extensive and the reactions they excite are so far spreading that their association with the reactions and mechanisms of other receptors is especially wide-spreading. It is for this reason that the training, or perhaps better the reclamation of the sense of smell can affect the memory and bring back from the unconscious so much of the past.

III. COMMON SEPTAL DEVIATIONS.

Ideally, the nasal septum is perpendicular. As a matter of fact, among individuals of the Caucasian race, it is seldom quite median. If any judgment can be based on the number of applicants for correction of deflections, it may be said that negroes are comparatively free from such deviations. Morell Mackenzie found that asymmetry existed in nearly 77% of 2,000 Caucasian skulls examined. It is the opinion of the writer from his observation of cases entered in New York hospitals that fully 75% of all cases entered present septal deformities of more or less serious character.

In general, when we speak of a "deviated septum," we mean the exaggerations of the departure from the median which are pathological or obstructive. So long as the deviation is slight and causes no interference with breathing or with drainage from the sinuses, it is of little importance except perhaps from an aesthetic standpoint. Only deviations so pronounced and pathological as to call for surgical interference are the subject of this study. Among the chronic troubles resulting from their neglect are the following: Interference with breathing, obstruction of the drainage of the sinuses, pharyngitis, laryngitis, and catarrh of the middle ear. Ear difficulties almost always occur on the side on which there is interference with breathing, when the difficulties are the result of septal deviations.

In a consideration of the etiology of septal deviations, the writer as a result of his own observation finds himself in agreement with Killian that the majority of those calling for surgical procedure are traumatic. There are others, however, which can be grouped under the descriptive term "developmental." (Porter.) In the absence of a definite history, such a distinction is difficult. Except in the case of bowed deviations associated with a high arched palate, it is very probable that many supposedly developmental deviations are actually traumatic. This would be more true of boys than of girls because of the more violent sports of boyhood. There can be little doubt that with the extension of the present movement for the physical examination and care of school children, a connection will be uncovered between these deviations and retardations in development, but too early operation on growing children for such difficulties is to be deprecated. Such operations should be deferred until they have reached fourteen years or even later.

As it has been found that the resection of the septum relieves an imposing number of cases of hay fever and asthma, the writer ventures into this perplexing neurological field. In a general way, these diseases are classified as nasal reflex neuroses in which there is present hyperesthesia of the nasal mucous membrane—probably in the ethmoid region.

The work of Pavlov, Bechterew, Cannon, Crile and others has placed on a scientific basis "what has been known empirically for centuries, that emotional factors are capable of producing acute as well as structural alterations . . . as well as being constantly operative in causing so-called functional disease."*

Neurologists hold that asthmatic attacks may have their exciting causes at any one of the three levels, physico-chemical (autonomic,) sensori-motor, or psychical. On the sensori-motor level the inducing cause may be pressure on laryngeal or bronchial nerves, or reflexes from the nose. The problem therefore in treating asthma is first to find which level is chiefly involved. It is here that a future lies for inter-relational therapy. It is possible that such baffling disorders as horse and cat asthma may derive their psychogenic etiological factors from the unconscious odor associations to which we have already referred (Chapter II). A union of forces among the branches of medicine and therapy will accomplish much to clear up such obscure cases and give relief to the unhappy victims. But before that time comes the surgeon has it in his power to benefit many cases. In narrow noses dust particles, steam heat, tobacco smoke, and other like irritations increase the hyperaesthesia. It is a matter of record that there have been more nasal difficulties since the building of the New York City subways, with their dust and stale air. In order to properly treat these cases free passage for air through the nose must be provided, and this often calls for the correction of septal deviations.

Various attempts at classification of septal deviations have been made. In view of the fact that so many of the deviations are traumatic, it is evident that we are dealing with such variables as the direction of the original blow, the resistance offered, the location of the trauma, the age of the victim, etc. We shall endeavor to clarify our description by classifying deviations as (1) bowed or curved, and (2) angular. To aid in visualizing them they may be called S-deviations and Z-deviations, picturing these letters as crossing the median line of the septum. Such a rough general classification is an attempt to distinguish between the results of fracture and bending. It is evident that traumatic cases would most often fall among the Z-deviations, while the S-deviations would include along with traumatic deviations the greater number of so-called developmental deviations. There are, however, nondescript cases in which the bone and cartilage have been so injured and dislocated by the blow as to fall under neither of the suggested headings. Because of their special problems we shall later describe the surgical procedure necessary in dealing with such cases.

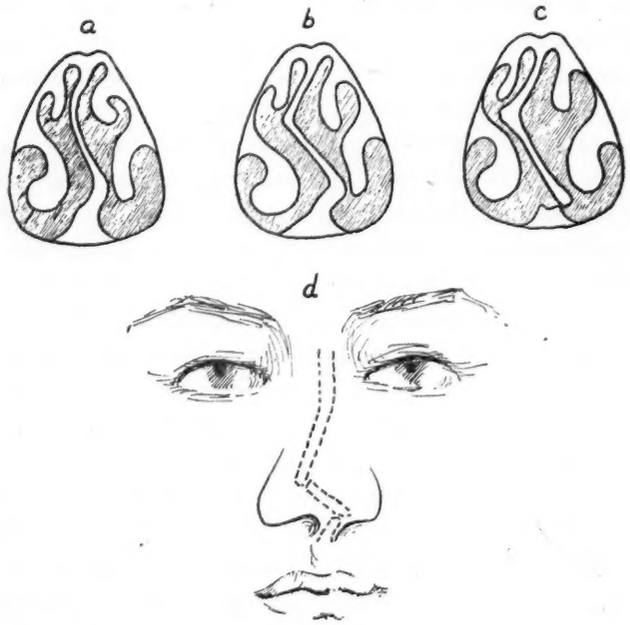

Fig. 1—Diagrams of typical deviations; *a*, "S" Deviations; *b*, "Z" deviation; *c*, nondescript with dislocation; *d*, fracture.

When we recall the distribution of function among the anterior and lower part of the nose, the posterior part, and the upper part, it will be evident that high deviations of either class do not cause interference with breathing experienced by those who have obstructions in the lower or anterior part of the nose. These anterior obstructions, some of which are almost horizontal, turn the air currents from their accustomed paths. In many of the S-deviations we find deflections of both bony and cartilaginous portions of the septum, many of them more marked anteriorly and curving out toward the turbinates in such a fashion as to interfere seriously with normal breathing (Fig. 1-*a*.) In such a type the lower part of the curve is often sharper, causing greater difficulty with this function than in the case of the upper curve. It is the higher curve that interferes with drainage and that is more apt to cause nervous symptoms. The line of deflection in these S-deviations is anterior-posterior, or

*Smith Ely Jelliffe, and Wm. A. White, *Diseases of the Nervous System*, 3d ed, 1919, p. 122.

along the perpendicular line, instead of being almost horizontal as in many of the Z-deviations. In crossing the median line the deviation causes the blocking of both passages, with a marked low obstruction on the one side, a slighter high obstruction on the other. The variations in the S-type are not apt to be so extreme as in the Z-deviations, although the reservation must be made that there have been cases observed by the writer of the S-type which were so twisted as to approach the horizontal rather than the perpendicular plane. Because the S-deviations are more often true to type they form the basis for the operation described in Chapter IV. The special procedures will be described in Chapter V.

The angular, or Z-deviation, is an exaggeration of the curved or S-deviation, and presents more anomalies. As in the S-type the anterior deflection is more marked and is apt to be sharper than the posterior deflection. The original trauma may have resulted in fracture, with dislocations, blood clots, etc. (Fig. 1-*b*). These deviations are frequently associated with crests or ridge on the septum, usually a little above the floor of the nose and commonly along the line of the junction of the intermaxillary ridge, the triangular cartilage and the vomer, running upward and backward from the nasal spine. These ridges are sometimes very large, extending into the nasal cavity so far that they are in contact with the lower end of the inferior turbinates. They may be bony or cartilaginous or both, and always present difficulties in surgical procedure.

The muco-perichondrium covering the septum is normally easily separable from the septum. Its point of least resistance to injury is near the center. If a fracture occurs at this point it is often followed by hemorrhage. In the healing process the clots frequently become the centers of growths and adhesions, themselves obstructions and centers for further abnormal growths as time goes by, These thickenings and adhesions, accompanied by tension of the membrane, are the source of operative problems. The membrane on the convex side is liable to atrophy, as in the case of all convex surfaces.

It is evident that the Z-deviations are more involved, present more anomalies, and call for more variations in surgical procedure. In one of the more common variants of this type there is a low angular deflection which crosses the median line low in the nose at what approaches a right angle, returning to the perpendicular posteriorly with a wider angle. (Fig. 1-*d*.)

In both the S-deviations and the Z-deviations, as a rule, a low ridge obstructs the inferior and middle meatuses on the narrow side, while the other side is left too wide open, with the result that the inferior turbinate is often enlarged. The upper bend often forces the middle turbinate outward, thus causing obstruction to the drainage of the superior meatus and accessory sinuses. The lower part of the deviation presses against the inferior turbinate anteriorly, not as a rule posteriorly, while the upper curve presses against the middle turbinate anteriorly or for nearly its whole length. The posterior part of the obstruction is often bony and is usually covered with cartilage, while the spurs also are both bony and cartilaginous.

There are cases in which the force of the original blow was great enough to dislocate the septal cartilage from the moon-shaped groove into which it was originally fitted. The cartilage would then fall on one side or the other of the ridge, depending on the direction of the blow, and the groove would gradually be filled in with fibrous tissue. (Fig. 1-*c*.) Another result of this dislocation would be thickening and spurs, with an elongation of the cartilage. Cases of curved deviations accompanied by a sharp spur and a groove are especially difficult from the surgical point of view because of the danger of tearing the membrane.

Sometimes the septum has been torn loose in the anterior portion and pressed to one side. (Fig. 1-*d*.) As a result of such a dislocation part of the cartilage often lies in a position approaching the horizontal across the inferior meatus. Part of it may cross the median line and partially block the vestibule of the open side of the nose. In a good many of such cases the dislocated portion of the cartilage is separated from the rest of the septal cartilage by the fracture, the gap between the parts being filled with fibrous tissue. This creates a difficult situation and necessitates a variation in the techique of the ordinary operation.

It is not to be understood that this chapter has exhausted the possible varieties of classification of septal deviations. All that has been undertaken is to simplify the description of the results of trauma and resultant malformation in order to work out a method of procedure for the simpler cases, which can be modified to fit the less ordinary cases. With these facts in hand, the procedure in the classic operation for curved or S-deviations will be better understood and more easily modified to meet involved situations.

(*To be continued*)

VARICOSE VEINS OF THE BROAD LIGAMENT: OR VARIX OF THE FEMALE PAMPINIFORM PLEXUS.*

OLIVER H. KELSALL, A.B., M.D.,
LOUISVILLE, KY.

It is my opinion that varix of the female pampiniform plexus occurs with greater frequency than is generally supposed, and because it is at times overlooked necessary operations upon the uterus or its adnexa for other affections fail in affording the patient complete relief.

The authors of most text-books on gynecology do not even mention broad ligament varicocele, and others who discuss the question dismiss the subject with two or three lines. Reed, of Cincinnati, who gives the matter greater attention than the majority, says: "Varicocele of the broad ligament is probably not as uncommon as supposed. There are but few operators of long and extensive experience who do not come, accidentally, across cases of this kind in their abdominal and gynecological work; yet we find the literature on this subject exceedingly meager. Rousans of Paris and Bagot of this country state that pelvic varicocele is of frequent occurrence." If I am not mistaken the first case of broad ligament varix reported in this country was by Dwight in 1887; four cases have since been recorded by Dudley, and two each by Malins and Zinke; Darnall (1914) stated that "he has operated on ten cases during the past year;" Winckel (Reed) found the condition present only ten times in three hundred necropsies.

The causes of broad ligament varix may be divided for convenience into (a) general, and (b) local.

General Causes: Subinvolution of the uterus and ovarian vessels with persistence of pelvic engorgement long after confinement, this in turn being produced by unrepaired or unhealed lacerations of the pelvic floor, too early and too much activity following labor, etc.; a relaxed condition of the tissues due to lowered vitality; an unhealthy state of the vessel walls; absence of valves in the veins.

Local Causes: The anatomical relations of the veins themselves, the spermatic and ovarian veins being of such great length that the weight of the long column of blood is sufficient in itself to somewhat weaken the vessel walls; habitual constipation with consequent daily straining at stool is another mechanical cause; malposition of the uterus, the organ being bent or turned backward producing torsion of the vessels thus obstructing the free flow of blood and causing venous dilatation.

The reason varix occurs more frequently in the left than in the right broad ligament is thought to be that the venous blood from the left side empties into the left renal vein (a relatively small vessel) at right angles, whereas the right discharges into the large vena cava at an acute angle; the right side thus having freer and better drainage than the left.

The same anatomical grounds in the male explain the greater frequency of varicocele on the left side; the position of the spermatic vessels behind the ileo-pelvic colon and the anastomosis to the renal vein should be considered, especially the first factor when aggravated by chronic intestinal stasis. These mechanical elements are not, however, pathogenic; we have to take into consideration the condition of chronic inflammation of the fibrous tissue, which English authors call fibrosis or fibrositis and which is usually produced by a slight infection. (Adami).

An endophlebitis may, of course, also be a cause. There should also be added increased intra-abdominal pressure from any cause; frequent application of forceps during labor; repeated abortions and disease of the pelvic organs, such as pyosalpinx, ovarian prolapse, etc. Sometimes thrombi form and these occasionally undergo calcareous degeneration thus increasing the obstruction.

Symptoms: The clinical symptoms are somewhat similar to those of varicocele in the male. The pain is heavy, dull and aching in character, increased by long-continued erect position, correspondingly lessened and relieved when the recumbent posture is assumed. The patient may give a history of malaise, nervousness, general indisposition, and is sometimes melancholic. There may be frequent and profuse menstruation, amounting to metrorrhagia, and this may occur in women beyond the menopause.

We must remember that there is a reason for almost every physical discomfort, if we can but "run it down"; and there is an explanation of the child-bearing woman who vainly goes from one physician to another with aching pains in the pelvis and back, dragging sensation worse on standing and walking and worse at the menstrual period, and suffering from all the symptoms of pelvic engorgement and pelvic irritation, although the examining physician may not be able to palpate anything on which to base a diagnosis. By failure to find anything tangible, the woman is often assured that

*Read before the West End Medical Society, Louisville, Ky.

there is absolutely nothing the matter and is in the mind of her doctor consigned to that large class of neurotics with imaginary symptoms which center in the pelvis. (Darnall).

Diagnosis: The clinical diagnosis of broad ligament varix occurring by itself must of necessity be difficult; but associated therewith other pathological lesions and varicosities are generally noted. Phleboliths are as a rule recognized only after the abdomen has been opened for the relief of other conditions. The knotted and swollen veins are best felt with the patient in the upright position; when recumbent only a "doughy" thickening is apparent. The presence of knotted and swollen veins determined by palpation, the patient giving a history of dull, heavy, aching pain together with the other symptoms outlined, should cause the observer to suspect broad ligament varix; but one must not feel too certain about the accuracy of his diagnosis. The surgeon is usually called upon to operate for associated disease, rarely for broad ligament varix *per se;* not infrequently, however, experienced surgeons after having made the diagnosis of salpingitis, oophoritis, or salpingo-oophoritis, have found at operation that both the ovaries and the Fallopian tubes were normal, and that an existing pelvic varicocele had caused all the pain and suffering.

Varicose veins (of the broad ligament) can rarely be palpated and then only with the patient in the standing position; but the diagnosis can be made from a careful study of the history and the clinical symptoms. (Darnall). Chronic appendicitis is the commonest error made in diagnosing these cases. Some of the patients are subjected to appendicectomy with, of course, negative results. The diagnosis, chronic metritis is the next most common error. (Wall).

Treatment: Little need be said concerning the treatment as it is simple. Of course, if there is uterine retroversion or retroflexion, palliative measures, replacement, pessaries, knee-chest position, etc., may be tried; but it is well known that as a rule such procedures merely postpone the day of operation.

The operative treatment consists of multiple ligation of the veins with incision between the ligatures. If the ovary is prolapsed the Mauclaire-Barrows operation may be performed to advantage. Malpositions of other organs and any co-existing pathological affection must be given the requisite surgical attention.

There are in the medical literature some cases of retro-uterine hematocele and ovarian hemorrhage which possibly may be attributed to rupture of a varicose vein. The bursting and bleeding may take place between the layers of the broad ligament, thus giving rise to a hematoma the result of which is ultimately and usually a fibrous newgrowth—a kind of fibroma. (Wall).

All of us have no doubt seen women operated upon for pyosalpinx, salpingo-oophoritis, uterine retroversion or what not, where everything was done at the time that was thought proper; and yet the patients were not completely relieved; they were still sufferers, "neurasthenics"; and these cases have had a tendency to bring ill-repute to recognized surgical procedures. Therefore, it is the hope of the writer that, thus calling further attention to the condition described, may be the means of contributing in small degree, at least, to more complete relief by gynecological operations.

REFERENCES.

Adami: Cited by Wall, l. c.
Darnall: *Journal of the A. M. A.*, August 1, 1914.
Wall: *Surgery, Gynecology and Obstetrics,* July, 1916.

EXOPHTHALMIC GOITER IN A GIRL OF SIXTEEN, WITH SPECIAL REFERENCE TO ETIOLOGY AND END-RESULTS FOLLOWING LIGATION WITHOUT THYROIDECTOMY.

ALBERT M. CRANCE, M.D.,
BAY CITY, MICHIGAN.
(From the Department of Diagnosis, Jones Clinic.)

The usual surgical procedure in exophthalmic goiter consists of ligation of the superior thyroid vessels at an interval of about one week, followed by thyroidectomy in three or four months. If thyroidectomy is not done at this time, increased hyperplasia usually takes place in the gland and a rapidly increasing degree of toxicity develops, which in many instances results fatally. However, we occasionally find patients who refuse operation for the removal of the goiter, and the results are usually not observed because the patients leave the care of the surgeon. In the case reported herein we have been able to observe the progress of a well-marked case of Grave's disease, as well as the end-results following ligation without subsequent thyroidectomy. The case also presents some interesting facts in regard to etiology.

Laura K., a Polish-American girl, aged 16, entered September 16, 1919, with a complaint of extreme nervousness, shortness of breath, bulging eyes and goiter.

Family history: Negative as to similar conditions, carcinoma or tuberculosis. The patient had five elder sisters, a young brother and sister, all in good health.

Menstrual history: The menstrual periods had not yet appeared. None of her elder sisters had menstruated before reaching 16 years of age.

The former health had been good, with no diseases of childhood.

Habits: Formerly two or three cups of coffee had been taken daily, but not recently.

Present illness: The patient's first symptoms of general weakness, with occasional aching pains in the legs, appeared just prior to 1919. At about the same time she noticed enlargement of the neck and

Fig. 1—Photograph illustrating the appearance of the patient, Sept. 18, 1919. (Published with permission).

exophthalmos, both of which symptoms have progressively become more noticeable. For the past year she has complained considerably of palpitation, progressive nervousness, general weakness and tremor. Dyspnea began six months ago and has steadily grown more severe.

The patient's appetite has been very poor. She eats cereals mostly. Such foods as meats, potatoes and toast disagree with her. Her bowels have been regular except for an occasional attack of diarrhea. Recently the patient has complained of sweating considerably, which is more marked at night.

Two months ago she had attacks of vomiting which lasted for 3 or 4 days. Three months ago her weight was 84 pounds. At present it is 75 pounds.

Previous treatment: For a period of one year the patient had taken a prescription which she described as "tea-colored, with the taste of iodine." This description would suggest that she had been taking Lugol's solution. At the same time she had been taking some prescribed tablets.

Physical Examination: General appearance: The patient presented a dejected appearance (See Fig. 1). She was extremely nervous. Her height was 5 feet 1 inch; weight, seventy-five pounds.

Scalp: A moderate degree of seborrheic dermatitis existed. The hair was extremely thin, espe-

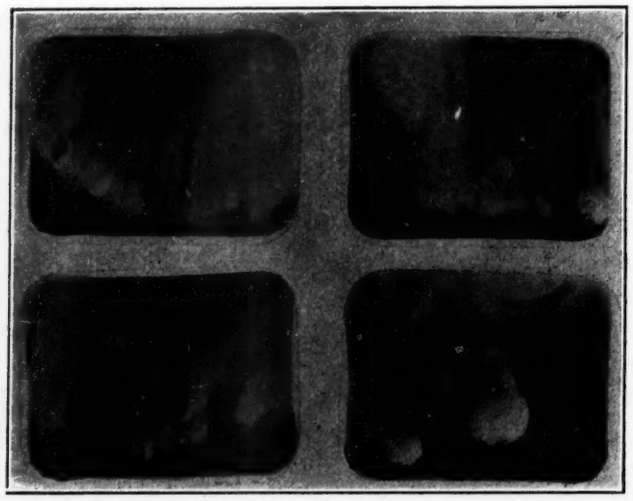

Fig. 2—Roentgenograms of upper teeth showing left second bicuspid and right first bicuspid abscessed. The right first molar shows a stump with two roots.

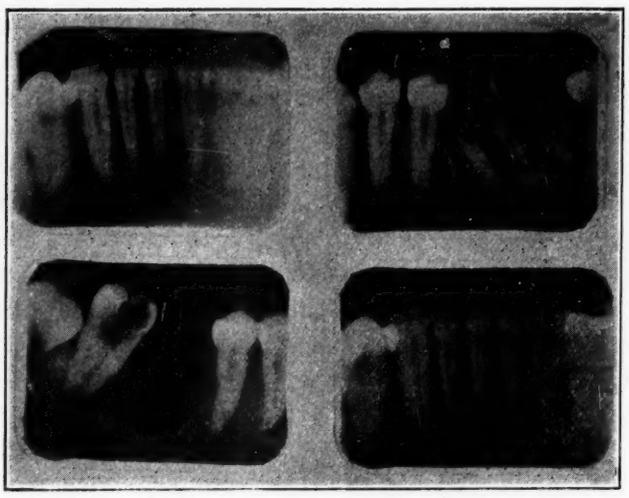

Fig. 3—Films of lower teeth, showing the right and left second molars abscessed, with a questionable abscess of the third left molar. The right first molar shows two remaining roots.

cially over the anterior portion of the scalp. There was marked prominence of the forehead.

Eyes: A marked degree of exophthalmos was present. (Fig 1). Von Graefe's sign was positive. The pupils reacted well to light and accommodation.

Teeth: A moderate degree of pyorrhea existed. There were several badly decayed teeth.

Her tonsils were very large; on either side they nearly reached the midline. There was marked chronic pharyngitis present. The submaxillary glands were enlarged and hard on both sides.

Thyroid: The gland showed moderate enlargement, which was more noticeable on the right side. It was movable and moderately hard. The circumference of the neck at its greatest diameter was

thirteen inches. The breasts showed no signs of mature development.

Heart: Inspection of the anterior chest wall revealed a visible heart beat which extended from below the ensiform cartilage upward into the vessels of the neck. A thrill could be palpated best at the apex, but could also be elicited over the entire precordium. A loud systolic murmur which was loudest at the apex could be heard throughout the chest. It could also be heard along both sides of the neck. There was marked tachycardia. The pulse-rate was 132. There was a systolic blood pressure of 130 and a diastolic blood-pressure of 60.

The lungs presented normal physical signs.

The abdomen, genito-urinary organs and rectum revealed nothing abnormal.

The legs and feet showed a mild degree of edema.

The patellar reflexes were normal.

A résumé on the day of examination was set down as follows: Exophthalmic goiter; *x*-ray teeth and extract by degrees; tonsillectomy; double-ligation of superior thyroid vessels; thyroidectomy.

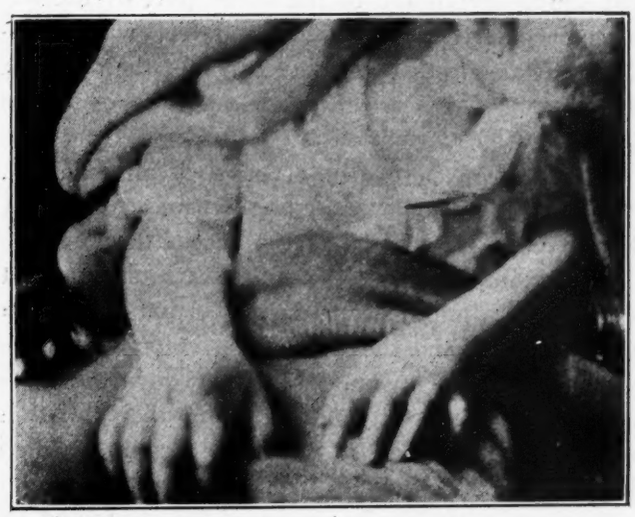

Fig. 4—Photograph taken March 11, 1920, to illustrate the extent of edema in the hands, which was more marked on the right side.

Laboratory Findings: Roentgenography of the upper teeth showed the left second bicuspid and right first bicuspid to be abscessed. The right first molar showed a stump with two roots. (Figs. 2 and 3). Roentgenography of the lower teeth showed the right and left second molars to be abscessed, with a questionable abscess of the third left molar. The right first molar showed two remaining roots.

Urine: Slightly alkaline; negative for albumin, sugar and casts.

The blood: hemoglobin, 85%; leukocytes, 7600; polynuclears, 74.4%; small lymphocytes, 19.8%; large lymphoctyes, 5.8%.

The Wassermann reaction was negative. The oxydase test showed a decrease in the amount of oxydase in the blood. 5 c.c. of a 1 to 400 dilution of blood liberated 9 c.c. of oxygen in 15 seconds when mixed with 3% peroxide. (Normal 15 to 17 c.c.)

Treatment and Observations: The infected teeth were extracted at the rate of one or two every four or five days.

September 29, 1919: The heart sounds were about the same as on the day of her first examination. The last two infected teeth were extracted. The pulse rate was 140. The systolic blood-pressure had dropped to 112, while the diastolic pressure remained at 60.

October 4, 1919: Tonsillectomy was done under local anesthesia. The tonsils were both very large. Each contained large areas of hard fibrous tissue, and small abscesses.

October 12, 1919; P. M.: She entered the hospital.

October 13, 1919. A. M.: The patient was prepared for ligation. She was given ⅛ gr. morphine sulphate by hypo. She became so excited and frightened that it was decided not to take her to the operating room. She was dismissed to return in one week.

October 19, 1919: The patient stated that she felt much better. The heart sounds were apparently the same. The pulse rate was 140; the systolic pressure was 110; the diastolic pressure was 60.

October 19, 1919: Again entered the hospital.

October 20, 1919. A. M.: She came to the operating room in good condition, but again became very excited; the pulse reaching 160. She was returned to her room.

October 23, 1919: Ligation of the left superior thyroid artery and vein was done under local anesthesia, using 1/5 of 1% cocaine with adrenalin. She stood the operation very well.

October 30, 1919: Ligation of the right superior thyroid vessels was done. Uneventful recovery.

January 19, 1920: The general appearance of the patient was improved. There was marked decrease in the amount of nervousness. The circumference of the neck was 12 in., a decrease of one inch. Her weight was 78 pounds; an increase of three pounds. The heart sounds were improved. The visible area of the cardiac impulse had decreased to an area of three inches in diameter, centered about the apex. Systolic blood-pressure, 108; diastolic, 50; pulse, 140.

The patient was urged to go to the hospital for a few days' observation previous to thyroidectomy. She delayed it, and continued to delay it until, after the latter part of February the decline began. She was seen on February 20, 1920. At that time the heart was severely decompensated. There was edema in both extremities which was very marked on the right side, as well as a moderate degree of ascites. (Fig. 4). The goiter had diminished in size so that it was scarcely visible.

March 10, 1920: The urine for the first time showed a moderate degree of albumin, and an abundance of epithelial cells. March 11, a rapidly increasing dyspnea developed and the patient died.

Comment: This case is rather interesting for several reasons. First, the marked severity of the disease in a girl of sixteen; second, the strong possibility of focal infection as a contributory factor in the etiology; third, the removal of foci of infection as a preliminary pre-operative measure, as done in this clinic; fourth, the result of ligation of the su-

perior thyroid vessels; fifth, the marked improvement following; and sixth, the rapid decline and end-results after the patient had procrastinated and delayed coming back for thyroidectomy.

The dental *x*-ray illustrations (Figs. 2 and 3) show several focal points of infection. Her tonsils were also very large, and their pathology decidedly showed infection. The reason for a girl of this age having such a marked case of exophthalmic goiter seems unexplainable unless it was due to the extensive amount of focal infection present.

After ligations, this patient improved remarkably. She delayed a much urged operation at the end of three months, the results of which are perfectly obvious. In this particular case it was more indicative at the three-month period than at the fourth. The decline was rapid. The patient died from cardiac decompensation associated with extreme emaciation.

Conclusion: 1. It is probable that focal infection is an etiological factor in exophthalmic goiter.

2. The progress of a case of exophthalmic goiter illustrates well the absence of permanent beneficial result from vascular ligation and other therapeutic measures without thyroidectomy.

INTUSSUSCEPTION OF THE COLON CAUSED BY ANATOMIC DEFECT. A CASE REPORT.

LOUIS FRANK, M.D., F.A.C.S.,
LOUISVILLE, KY.

The following case seems of sufficient interest to warrant its being recorded, not particularly because of the lesion which necessitated bringing the patient to me for operation but from the anatomic condition which was discovered after opening the abdomen.

On May 10, 1919, a child aged two years and nine months, was brought to me with the diagnosis made by the family physician of intussusception. We immediately opened the abdomen and found the entire cecum and ascending colon invaginated into the remaining portion of the large intestine and presenting at the anal outlet as was easily determined by rectal examination.

The invagination was easily reduced. It was then noted that the entire ascending colon and cecum were "hanging loose" within the abdominal cavity. There was tremendous engorgement of the mesenteric vessels of the ileum and also the ascending colon.

The child presented no further symptoms referable to the abdomen after the operation. Slight localized signs of pneumonia were noted when the child was first examined, but we did not consider these sufficient to delay the operation which was performed under general anesthesia.

The feature particularly worthy of note, and my reason for reporting the case, is that the entire cecum, ascending colon and part of the transverse colon were freely intraperitoneal. This was not due to stretching of the normal attachments, but represented an anatomic defect congenital in origin. When the large intestine was lifted from the abdominal cavity it was noted that the lower part of the ascending colon and cecum had no mesenteric attachments.

After reduction of the intussusception the entire small intestine was found to occupy the upper right abdominal quadrant, and the descending colon, the transverse colon, the cecum and ascending colon had simply gravitated to the lower part of the abdominal cavity. The anatomic defect was overcome by anchoring these structures in their proper positions. This left underneath two fossae through which herniation is possible.

I have never before observed such an anomaly, and think it must be exceedingly rare. Search of the literature to which I have access discloses no similar example. The only way I can conceive that such a defect might occur would be that the cecum in its rotation and the descending colon in its descent, instead of pushing their way downward beneath the peritoneum and retaining their fixation to the posterior wall as normally occurs, pushed the peritoneum along in front of them. The defect was not artificially produced by stretching of the mesentery of the meso-colon.

It is presumed the anomaly described was the cause of the intussusception.

DRAINAGE IN CHOLECYSTECTOMY.

In cholecystostomy there is no special problem in drainage; but in cholecystectomy the method and position of drainage is open to question. It is an axiom that the best drainage is dependent drainage which is frequently best secured through a counter incision at the bottom of Morrison's pouch. In fact, in cholecystectomy, the question of drainage is paramount, for if it is not adequate, a sub-phrenic abscess may be established. If adequate dependent drainage is not established through Morrison's pouch, then it must be ample through the abdominal incision, so that by no chance will there be an accumulation of fluid at any one point which may be dispersed by the respiratory movements.—GEORGE W. CRILE in the *N. Y. State Journal of Medicine.*

American Journal of Surgery

PUBLISHED BY THE

SURGERY PUBLISHING CO.

J. MacDONALD, Jr., M. D., President and Treasurer

15 East 26th St., New York, U. S. A.

to whom all communications intended for the Editor, original articles, books for review, exchanges, business letters and subscriptions should be addressed.

SUBSCRIPTION PRICE, TWO DOLLARS. FOREIGN, TWELVE SHILLINGS.

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.

It is of advantage to submit typewritten manuscript; it avoids errors.

CHANGE OF ADDRESS. Subscribers changing their address *should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.*

ILLUSTRATIONS. Half-tones, line etchings and other illustrations will be furnished by the publishers when photographs or drawings are supplied by the author.

SPECIAL NOTICE TO SUBSCRIBERS

The "American Journal of Surgery" is never sent to any subscriber except upon a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, M.D., F.A.C.S., Editor.

NEW YORK, JANUARY, 1921.

RESULTS OF SECONDARY PERIPHERAL NERVE SUTURE.

The observations on peripheral nerve injuries made by Weir Mitchell and W. W. Keen in the Civil War laid the foundation for the intensive study of these lesions in the cases which the World War provided in pitiful abundance. In physiology, symptomatology and clinical course, in prognostics and in treatment a wealth of material has been added to our knowledge, and made familiar to us through the admirable works of Tinel, Mme. Athanassio-Benisty and many others.

A sufficient time having elapsed, for the earlier cases especially, what is now of interest is an analysis of end-results in surgical operations for the restoration of divided nerves. Reports of these results have been made by various observers; and Professor Thorburn, of Manchester University, has published in *The Lancet,* (September 25, 1920) a brief but interesting survey of the larger series of these reports.

Of 108 personal cases of suture or grafting analyzed by Timel, 14 were complete failures, 22, or say 20 per cent., showed practically complete recovery, and the remainder were regarded as improved.

S. W. Daw says that 40 per cent. of his cases showed signs of returning motor power after seven months.

J. Sherren found that of 21 eases of secondary suture some return of motor power took place in all, but that it was never complete.

R. Kennedy, examining after a long period cases occurring in civil life, claims that 73 per cent. of all sutures were completely successful.

Dumas investigated 115 personal cases of operation for war wounds of one nerve only, musculo-spiral; but it must not be forgotten that for several reasons this yields better results than any other nerve. He claims evidence of recovery in 42 per cent. of his cases, and of some regeneration in 65.2 per cent., the remaining 35 per cent. being presumably entire failures.

J. L. Joyce found in 36 cases of secondary suture 8 recoveries, 6 with considerable improvement, 8 with some improvement, and no result in 14.

H. S. Souttar and Twining found that of 61 cases of suture 7 recovered, 32 were recovering at the time of report, 7 were doubtful, 2 were failures, and 13 were not traced; but their results, like those of Joyce, would probably be improved by a later report, as in many cases the time elapsed had not been sufficiently long.

Adson reports the results of operation on 41 cases, four-fifths of which were end-to-end suture and the remainder plastic operations. Of 30 cases traced "the average amount of improvment obtained was 58 per cent. return of the sensory, 62 per cent. return of the motor, and 67 per cent. return of the trophic functions"; 73.1 per cent. showed improvement.

These figures, which are by no means easy to compare, leave the impression that secondary nerve suture gives very good results in somewhere between one-third and two-thirds of all cases, but . . . a perfect neurological recovery is rarely if ever obtained. . . . Complete failures are by no means uncommon, and must be looked for in a very definite percentage of even the best operations.

A study of the process of nerve regeneration effectively disposed, as unphysiological and futile, of the operation of suturing a divided nerve to the side of a healthy one; it showed that a nerve cannot be repaired, like a tendon, with plastic lengthening by dividing and turning some of its fibers. As compared with such plastic efforts nerve grafting is more physiological since it attempts to provide the channels in which the growing axons may descend; but grafting, too, is a doubtful measure that is to be resorted to only in those cases of larger defect in which, in spite of stretching, posture and shortening its anatomical course, it is impossible to bring together the divided ends of a nerve for accurate suture. Of grafting, which Thorburn also would employ only as a last resort, he says:

> Certain isolated cases are reported in which brilliant results are claimed, . . . but there is certainly as yet no large number of good results obtained from grafting. . . . I have yet to see personally any cases in which it has been a success. I have seen cases in which it has been reported as successful, but which to my mind did not carry conviction.

Thorburn emphasizes the importance of distinguishing "physiologic recoveries," in which undoubted nerve regeneration has been accomplished, and "economic recoveries" in which the affected parts have been restored to a fair measure of usefulness, and he concludes, "the greatest optimism is generally that of the man who records a few remarkable cases—often a single case. After many years I can only say that if a surgeon obtains 50 per cent. of really good economic recoveries after secondary nerve suture he is doing well; if he ob-

tains 75 per cent. of such recoveries, which will bear investigation, his work is both brilliant and fortunate."

SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

Properly performed in suitable cases the submucous resection of a deformed or deviated septum is a beneficent procedure, indeed. Yet there are few of the common operations in surgery that are more often executed badly, upon insufficient indication and with unsatisfactory results.

We believe, therefore, that the series of articles on this subject by W. Meddaugh Dunning of New York, of which the first instalment appears in this issue, will be read with interest, since it will present clearly and concisely the anatomic and physiologic bases for the operation, the indications and the technics.

Surgical Suggestions

With a streptococcus wound infection persistent diarrhea is strongly suggestive of sepsis.

Sarcoma of the lower end of the radius is usually of the relatively benign giant-celled variety.

The intravenous or intramuscular injection of pituitrin may be a life-saving measure in paralytic ileus.

With strangulation of a hernia very early vomiting, bloody vomitus and pain in the back suggest involvement of the mesentery.

In differentiating between gall-stones, ulcer and appendicitis, as the cause of epigastric pain, belching is significant of cholelithiasis.

Among the other non-surgical diseases that may symptomatically simulate acute appendicitis are pneumonia, malaria and the onset of measles or other exanthem.

Stricture of a salivary duct will produce the same symptoms as a stone therein. Stricture formation is not common and it usually occurs in the parotid (Stenson's) duct.

Intermittent swelling of the submaxillary region, generally associated with pain or discomfort on eating, means infection of the corresponding salivary gland. Pressure on the gland will cause pus to escape from the opening of its duct. If sounding Wharton's duct with a fine ear probe or lacrimal duct probe reveals the presence therein of a stone its removal by incision in the floor of the mouth will usually cure the trouble promptly—unless, by too long neglect of the infection the gland has become disorganized.

In *all* cases of rectal cancer an abdominal incision should be made before attempting removal, if not for purpose of performing the "combined operation," at least to determine, by exploration of the mesenteric glands and the liver, the presence or absence of metastases. Even in apparently favorable cases there may thus be found a growth in the liver that quite precludes a radical operation.

Book Reviews

The Fundamentals of Human Anatomy, including its Borderland Districts. By MARSH PITZMAN, A. B., M. D., Professor of Anatomy in the Dental Department of Washington University, St. Louis. Octavo: 343 pages; 101 illustrations. St. Louis: C. V. MOSBY COMPANY, 1920.

The avowed purpose of this "modern text-book of anatomy," is to present the subject from the standpoint supposedly most acceptable to the embryo-practitioner. An appeal is made that the sidelights of microscopic anatomy, zoology, embryology, physiology, pathology, the practice of medicine and surgery be permitted to illumine the subject of anatomy when it is taught, and that there be less anatomical pedogogy from the standpoint of pure science, with its inherent mass of detail. The author claims that the newer anatomies, in recognizing the first part of this broad point of view, have added so much borderland study, without diminishing the amount of pure anatomical material, that they have "graduallly grown into encyclopedias of our entire anatomical knowledge of the human body," and that these colossal compendia are too massive to use "if we are to avoid 'mental indigestion'."

This work is an effort to make both ends meet without sacrificing either anatomy or breadth of view, but the amount of actual anatomical detail given is so slight as to be almost negligible. For example, a little more than a page is devoted to the brachial plexus, including a half page diagram. The author admits that "this book makes no pretense except as an auxiliary to more complete works," but we do not understand how the student can utilize a text of this nature with any other.

Pensions and the Principles of Their Evaluation. By LLEWELLYN. J. LLEWELLYN. M. B. (Lond.) Late Temp. Member Appeals Tribunal Ministry of Pensions; Senior Physician and Governor, Royal Mineral Water Hospital, Bath (attached to Second Southern General Hospital); Fellow of Royal Society of Medicine, etc., and A. BASSETT JONES, M. B., (Lond.) Temp. Captain R. A. M. C.: Military Orthopedic Hospital, Whitchurch, Cardiff; Late Senior Surgeon, Cariganshire General Hospital; Fellow of Royal Society of Medicine. With a section on Pensions in Relation to the Eye. By W. M. BEAUMONT, Acting Ophthalmic Surgeon to the Bath War Hospital. Large octavo; 680 pages. St. Louis: C. V. MOSBY COMPANY, 1919.

While the basic facts employed by the authors emanate from England, their application is universal, and the methods described and detailed are of pre-eminent value

for the United States. Beginning with a historical review of the origin of pension systems, and an elucidation of the growth of the pension system in England to the present time, there is continued a variety of discussions on various aspects of pension legislation with a consideration of temporary and permanent pensions. The procedure in examination of claims for pensions is well illustrated by a variety of inquiries and examples which involve a thorough exposition of problems relating to the origin of disabilities, their evolution, and gravity.

More significant is the general tenor of the volume which deals with questions of human re-adaptation, which is a central theme to which financial equivalents are of secondary importance. Stress is placed upon the consideration of loss of function rather than on anatomical defects. With this point of view there is a most thorough and careful consideration of various injuries, and the factors to be considered in evaluating the assessments to be fixed. To this end there are separate chapters dealing with ankylosis, general and special fractures, scars, nerve injuries, lesions of muscles and tendons, bones and joints, amputations, together with special stress upon injuries of the eye, partial and complete blindness.

It is rare that one seizes upon the literary qualities of a technical volume as being of unusual merit, but the authors have manifested, even in their literary methods, a wealth of human understanding, a catholicity of view, and a sane, well-founded grasp of the essential spirit of a wise pension project. The wealth of surgical compilation in terms of prognosis, treatment, and functional restoration, is unequalled in any single volume familiar to the reviewer. Nor, indeed, is it possible to find a book in which an unstilted civic attitude finds finer expression.

There is a peculiar literary flavor that appears to transform the written word into sympathetic speech. It is a plea for right thinking, not merely in terms of anatomy, but in terms of function, personality, adaptation, individual and civic responsibility.

It is particularly timely, and the publication of this American edition should be regarded as a distinct contribution to problems that have arisen from the baneful effects of war, but no less to the equally damaging catastrophes and accidents of peace. The principles underlying the volume are the determination of the individual sacrifice, and a measure of the means and methods whereby this may be relieved so far as is humanely possible. It is a superior volume that crystalizes our present knowledge concerning the physiology, hygiene, surgery, education, ethics, and politics of pension systems.

Collected Papers of the Mayo Clinic, Rochester, Minn. Edited by Mrs. M. H. Mellish. *Volume XI, 1919;* Published September, 1920. Royal octavo; 1331 pages; 490 illustrations. Philadelphia and London: W. B. Saunders Company, 1920.

This volume of reprinted contributions from the Mayo Clinic and Mayo Foundation is uniform with its predecessors in size and arrangement, and in typographic and pictorial excellence.

The Accessory Sinuses of the Nose. By Ross Hall Skillern, M. D., Professor of Laryngology Medico-Chirurgical College, Post Graduate School, University of Pennsylvania; Late Lieutenant-Colonel, M. C., U. S. A.; Fellow of American Laryngological Society; Fellow of American College of Surgeons; Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the New York Academy of Medicine; etc., etc. *Third Edition.* Octavo; 410 pages; 300 illustrations. Philadelphia. J. B. Lippincott, 1920.

The third edition of this meritorious work, includes the author's experiences in the army with a number of cases of disease sinuses. He has also included new treatments and surgical procedures, that bring the book thoroughly up to date.

In our review of the first edition, we heartily commended the author for bringing out this special monograph. Dr. Skillern is recognized by his confréres as a man of exceptional ability. In this volume, as in former editions, he has been very particular to give credit to every man who has advanced our knowledge of diseases of the sinuses, a subject, which, up to a few years ago, was looked upon as a closed field except to those who had had unusual opportunities.

Neither Dead Nor Sleeping. By May Wright Sewall. With an introduction by Booth Tarkington. Duodecimo; 320 pages. Indianapolis: The Bobbs-Merrill Company, 1920.

A book designed to indicate a reason for believing in communication with the dead. Those who are interested in psychic phenomena will find themselves thoroughly interested, while unbelievers will be stimulated to further questionings as to the reality of contributions alleging communication with those who no longer live. At least the author had the purpose of aiding those hungry for psychic food that would further nourish their aching souls.

Books Received

The Oxford Medicine. By Various Authors. Edited by Henry A. Christian, A.M., M.D., Hersey Professor of the Theory and Practice of Physic, Harvard University; Physician-in-Chief to the Peter Bent Brigham Hospital, Boston, Mass., and Sir James MacKenzie, M.D., F.R.C.S., LL.D., F.R.S. Consulting Physician to the London Hospital and Director of the Clinical Institute, St. Andrews, Scotland. In Six Volumes. *Volume II*—Diseases of Bronchi, Lungs, Mediastinum, Heart, Arteries and Blood. Large octavo; 817 pages; illustrated. New York. Oxford University Press, 1920.

Anesthetics: Their Uses and Administration. By Dudley Wilmot Buxton, M. D., B. S., Member of the Royal College of Physicians; sometime President of the Society of Anesthetists; Member of University College; Consulting Anesthetist to University College Hospital and to the National Hospital for Paralysis and Epilepsy, Queen Square, and to the Royal Dental Hospital of London; Late Anesthetist to King George Hospital, and Administrator of Anesthetics and Lecturer in University College Hospital. *Sixth Edition.* Octavo; 535 pages; 89 illustrations. Philadelphia: P. Blakiston's Son & Co., 1920.

Nitrous Oxide-Oxygen Analgesia and Anesthesia in Normal Labor and Operative Obstetrics. A Monograph Prepared for the Benefit of all Those Concerned in Safer and More Efficient Obstetrics and Anesthesia. F. H. McMechan, M. D., Editor. Octavo; 97 pages. Columbus, O.: National Anesthesia Research Society, 1920.

Common Infections of the Kidneys, with Colon Bacillus and Allied Bacteria. Based on a Course of Lectures delivered at the London Hospital. By Frank Kidd, M. B., B. C., (Cantab), F. R. C. S., Eng.; Surgeon to London Hospital; Surgeon in Charge of Genito-Urinary Department, London Hospital; Member of the International Society of Urology; Member de l'Association Francaise d'Urologie. With an Additional Lecture on the Bacteriology of the Urine by Dr. Philip Panton, Clinical Pathologist, London Hospital. Octavo; 331 pages; 16 illustrations. London: Henry Frowde; Hodder and Stoughton, 1920.

Orthopedics For Practitioners. An Introduction to the Practical Treatment of the Commoner Deformities. By Paul Bernard Roth, M.B., Ch.B. (Aberd.), F.R.C.S. (Eng.), Senior Surgeon, and with Charge of Orthopedic Cases, Kensington General Hospital; Member of Orthopedic Section, Royal Society of Medicine; Late Surgeon, City of London Military Hospital; Senior Orthopedic Clinical Assistant, London Hospital, etc. Duodecimo; 190 pages; 57 illustrations. London: Edward Arnold, 1920.

A Manual of Practical Anatomy. A Guide to the Dissection of the Human Body. By THOMAS WALMSLEY, Professor of Anatomy in the Queen's University of Belfast. With a Preface by THOMAS H. BRYCE, M.A., M.D., Professor of Anatomy in the University of Glasgow. In Three Parts. Part I.—The Upper and Lower Limbs. Octavo; 169 pages; 59 illustrations. London: LONGMANS, GREEN & Co., 1920.

The Anatomy of the Human Skeleton. By J. ERNEST FRAZER, F. R. C. S., Eng., Professor of Anatomy in the University of London and Lecturer in the Medical School of St. Mary's Hospital; Examiner in Anatomy in the University of London and Lecturer in the Medical School of St. Mary's Hospital; Examiner in Anatomy for the University of London; Examiner in Anatomy for the Primary Fellowship of the Royal College of Surgeons of England; Formerly Examiner in Anatomy for the Conjoint Board of the Royal Colleges of Physicians and Surgeons. *Second Edition.* Quarto; 284 pages; 219 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1920.

History and Bibliography of Anatomic Illustrations, in its Relation to Anatomic Science and the Graphic Arts. By LUDWIG CHOULANT. Translated and Edited with Notes and a Biography by MORTIMER FRANK, B. S., M. D. Secretary, The Society of Medical History, Chicago; Attending Ophthalmologist, Michael Reese Hospital Chicago. With a Biographical Sketch of the Translator and Two Additional Sections by FIELDING H. GARRISON, M. D., and EDWARD C. STREETER, M. D. Royal octavo; 422 pages; illustrated. Chicago. THE UNIVERSITY OF CHICAGO PRESS, 1920.

Surgical Pathology and Morbid Anatomy. By SIR ANTHONY A. BOWLBY, K. C. B., K. C. M. G., K. C. V. O., F. R. C. S. Surgeon in Ordinary to His Majesty the King, and Consulting Surgeon to St. Bartholomew's Hospital; President, Royal College of Surgeons of England; and SIR FREDERICK W. ANDREWES, M. D., F. R. S., Lecturer on Pathology at St. Bartholomew's Hospital; Professor of Pathology in the University of London. *Seventh Edition.*. Octavo; 636 pages; 210 illustrations. Philadelphia: P. BLAKISTON'S SON & Co., 1920.

Tropical Ophthalmology. By ROBERT HENRY ELLIOT, M. D., B. S. (Lond.) Sc. D. (Edin.) F. R. C. S. (Eng.). Lieutenant-Colonel I. M. S. (Retired); Late Superintendent of the Government Ophthalmic Hospital, Madras, and Professor of Ophthalmology, Medical College, Madras; Honorary Fellow and Gold Medallist of the American Academy of Opthalmology and Otolaryngology; Lecturer in Ophthalmology, London School of Tropical Medicine; Ophthalmic Surgeon to the Seamen's Hospital Society, and to the Hospital for Tropical Diseases, Endsleigh Gardens, London. Octavo; 525 pages; 117 illustrations and 7 plates. London: HENRY FROWDE; HODDER AND STOUGHTON, 1920.

Clinical Ophthalmology for the General Practitioner, By A. MAITLAND RAMSEY, M. D., Fellow of the Royal Faculty of Physicians and Surgeons, Glasgow; Lecturer on Ophthalmology, University of Glasgow; Ophthalmic Surgeon, Glasgow Royal Infirmary; Author of "Atlas of External Diseases of the Eye," "Eye Injuries and Their Treatment," "Diathesis and Ocular Diseases," etc. With a foreword by SIR JAMES MACKENZIE, M. D., F. R. S. Large octavo; 500 pages; illustrated. London: HENRY FROWDE; HODDER AND STOUGHTON, 1920.

The Endocrines. By SAMUEL WYLLIS BANDLER, M. D., F. A. C. S., Professor of Gynecology in the New York Post-Graduate School and Hospital. Octavo; 486 pages. Philadelphia and London: W. B. SAUNDERS COMPANY, 1920.

Plastic Surgery of the Face based on selected cases of War Injuries of the Face, including Burns. By H. D. GILLIES, C. B. E., F. R. C. S., MAJOR R. A. M. C., Surgical Specialist to the Queen's Hospital, Sidcup; Surgeon in Charge of the Department for Plastic Surgery; and Late Surgeon in Charge of the Ear, Nose and Throat Department, Prince of Wales' Hospital, Tottenham; Late Chief Clinical Assistant, Throat Department, St. Bartholomew's Hospital; Hon. Fellow, National Dental Society of America. With Chapters on the Prosthetic Problems of Plastic Surgery by CAPT. W. KELSEY FRY, M. C., R. A. M. C., Senior Dental Surgeon, Queen's Hospital, Sidcup; Senior Demonstrator and Dental Officer in Charge of the Prosthetic and Metallurgical Department, Guy's Hospital; and Remarks on Anesthesia by CAPT. R. WADE, R. A. M. C., Late Senior Anesthetist, Queen's Hospital; Assistant Anesthetist, St. Bartholomew's Hospital; Anesthetist, Great Northern Central Hospital. Quarto; 400 pages; 844 illustrations. London: HENRY FROWDE, HODDER AND STOUGHTON, 1920.

Functional Nerve Disease. An Epitome of War Experience for the Practitioner. Edited by H. CRICHTON MILLER, M. A., M. D., Formerly Medical Officer in Charge Functional Cases, No. 21 General Hospital, Alexandria. Late Consulting Neurologist, 4th London General Hospital. Duodecimo; 198 pages. London: HENRY FROWDE, HODDER & STOUGHTON, 1920.

The Sympathetic Nervous System in Disease. By W. LANGDON BROWN, M. A., M. D. (Cantab.), F. R. C. P., (Lond.) Physician with charge of Outpatients, St. Bartholomew's Hospital, Physician to the Metropolitan Hospital, etc. Duodecimo; 147 pages; 9 illustrations. London: HENRY FROWDE, HODDER & STOUGHTON, 1920.

The Story of the American Red Cross in Italy. By CHARLES M. BAKEWELL. Duodecimo; 208 pages; illustrated. New York: THE MACMILLAN COMPANY, 1920.

A Text Book of Pharmacology and Medical Treatment for Nurses. By J. M. FORTESCUE-BRICKDALE, M. A., M. D. (Oxon) M. R. C. P. (Lond.) Capt. R. A. M. C. (T. F.); Physician to the Bristol Royal Infirmary and Clinical Lecturer in the University of Bristol; formerly Lecturer on Pharmacology in the University of Oxford. Large octavo; 371 pages; 74 illustrations. London: HENRY FROWDE; HODDER AND STOUGHTON, 1920.

Practical Dietetics, with Reference to Diet in Health and Disease. By ALIDA FRANCES PATTEE, Graduate. Department of Household Arts, State Normal School. Framingham, Mass., Late Instructor in Dietetics. Bellevue Training School for Nurses, Bellevue Hospital, New York City; Former Instructor at Mt. Sinai, Hahnemann and the Flower Hospital Training School for Nurses, New York City, etc., etc. *Thirteenth Edition.* Revised. Duodecimo; 469 pages. Mt. Vernon, N. Y.: A. F. PATTEE, 1920.

Die Chirurgie der Brustorgane. von FERDINAND SAUERBRUCH. Zugleich Zweite Auflage der Technik der Thoraxchirurgie von F. SAUERBRUCH und E. D. SCHUMACHER. *Erster Band.* Die Erkrankungen der Lunge unter mitarbeit von W. FELIX, L. SPENGLER, F. V. MURALT, E. STIERLIN, H. CHAOUL. Large Octavo; 860 pages; 637 illustrations. Berlin: JULIUS SPRINGER, 1920.

Des Andreas Vesalius, sechs anatomische Tafeln vom Jahre 1538 (in Lichtdruck neu herausgegeben und der 86. Versammlung Deutscher Naturforscher und Aerzie zur Feier der 400. Wiederkehr des Jahres seiner Geburt) dargeboten von MORIZ HOLL, Graz, und KARL SUDHOFF, Leipzig. Leipzig. JOHANN AMBROSIUS BARTH, 1920.